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## Programme element II.d (V)

## Matters left pending and other issues arising from the programme elements of the Intergovernmental Panel on Forests process

## Issues that need further clarification: valuation of forest goods and services

### Report of the Secretary-General

*Summary*

Forests provide a wide range of goods and environmental services, as well as other functions, such as cultural, spiritual and socio-economic values. "Valuation" is the economic quantification of these forest values. Valuation methods are relatively well developed, and numerous case studies exist in the literature. They show that some goods and services are easier to quantify and value than others, and it is not reasonable to assume that universally applicable values can be developed for all types of forest or all circumstances.

There is no consensus regarding the contribution of improved forest valuation to ensure sustainable forest management. There are potentials and constraints revealed in different views on valuation. Valuation is a fundamental and critical tool needed to promote the value of sustainable development activities to decision makers. While valuation estimates can make a significant contribution to negotiations and decision-making, valuation itself is often neither a necessary nor a sufficient condition for the implementation of policies that lead to improved forest management. Even in the absence of general estimates of value, a simple recognition of the wide range and importance of forest values is possible in decision-making.

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This being said, however, better quantified information provided by more effective and comprehensive approaches to valuing forests can be a powerful tool for improved policies.

The "internalization of the externalities", i.e., where users of natural resources are facing the full cost of their activities, including the cost of restoring damaged environmental resources and of compensating those who suffer damage, is the link between valuation and forest policy (e.g., economic instruments and regulation) to secure forest values. Valuation is an input to the development of appropriate policy actions to eliminate, for example, the underlying causes of forest loss and degradation or to improve forest management. It is necessary to improve the policy environment before an internalization of forest values can be effective.

Improvements in valuation will begin with more extensive and accurate information on the quantity of goods and services provided by forests, and how their loss or safeguarding affects others (in indirect or "chain-of-events" patterns). With appropriate caution, benefits estimates can be derived from methodologies and results derived from research studies.

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# I. Mandate and scope

## A. Mandate

1. Programme element II.d (V) was defined at the first session of the Intergovernmental Forum on Forests (IFF) as follows:

> "*Consider other issues arising from the programme elements of the Intergovernmental Panel on Forests (IPF) process needing further clarification ... inter alia* ... valuation of forest goods and services" (see E/CN.17/IFF/1997/4, para. 7, category II (d).

The work under this programme element is guided by the outcome of the second session of IFF, and will be the subject of substantial discussion at the third session of IFF.

## B. Scope

2. The topic of valuation encompasses the development and use of information on the absolute and relative importance of the many goods and services forests provide at the local, national, regional and international levels. The multiple values of forest goods and services are critically important to the decision-making processes that impact forests. Valuation of forest resources and other benefits is a contribution to a documentation of the full range costs and benefits of investments in forestry projects.

3. The present report recalls relevant conclusions and proposals for action from IPF and from previous deliberations in IFF, and addresses the need for and approaches to valuation in relation to other topics currently before IFF.

4. The topics covered in the present report are closely related to two other topics for consideration at the third session of IFF: financial resources (see E/CN.17/IFF/1999/4) and economic instruments, tax policies and land tenure (see E/CN.17/IFF/1999/13).

5. The present report, which has been prepared by the IFF secretariat, is based on inputs received from the World Bank, in collaboration with member organizations of the informal high-level Inter-Agency Task Force on Forests, as well as an in-kind contribution by the Government of the United States of America.

# II. Introduction

6. Any discussion of forest valuation must begin with the observation that there are different opinions on the importance of the valuation of benefits from non-market goods and services in forestry. These differences reveal both the potentials and constraints that can be attributed to forest valuation. One position is that forest valuation is of paramount importance to sustainable forest management, for example:

(a) Valuation is part of a successful application of economic instruments and regulation of market failures;

(b) Valuation is an input for policy decisions and funding allocation at the macro level and compensatory arrangements for sustainable forest management;

(c) Valuation can demonstrate true costs and benefits of alternative forest uses, management and conservation practices.

7. Another position is that valuation provides useful information for decision makers but that monetary valuation is not essential for promotion of sustainable forest management. For example:

(a) The net benefit of valuation is the gain from better decision-making after adjustment for the cost of collecting and analysing reliable data for valuation estimation, which is often costly;

(b) Valuation, on its own, is not sufficient to regulate the use of forest resources since it must be followed by such policy actions as regulation or forest investments;

(c) An exaggerated reliance on valuation may conceal the importance of other more important policy measures, such as effective governance, establishment of tenure, or the removal of price supports or subsidies.

8. Where conflicts over the use (management or protection) of forest resources are obvious and positions are entrenched, an assessment of the costs and benefits of choices and their distribution among the involved stakeholders can be part of resolving the problem.

9. The challenge of valuing forest goods and services is similar to the complexity of defining and achieving sustainable forest management. To address both the critical and promising issues of forest valuation the following observations are presented:

(a) Non-market forest goods and services — and moreover cultural, spiritual, and ethical values of forests — are fundamental considerations of sustainable forest management. The importance of these contributions of forests should not be contested in principle, even if they cannot be denominated in monetary terms;

(b) Resource use is most often determined by the distribution of costs and benefits of forest use, rather than the sum of either, aggregated across all stakeholders. As a result, local users of forests may not have an incentive to take into account all costs of actions. Including all costs and benefits to all users ("internalizing the externalities") is the aim of a policy to promote sustainable forest management. Better estimates of values can contribute to that effort (see box 1);

(c) There is a diversity of preferences among decision makers. Even at the local level, there is no uniform perception of value among individuals. The price of timber as determined by open, competitive markets is accepted as a measure of timber value, but for many non-timber commodities and for most services, there will be no consensus on the appropriate value to assign, e.g., of biodiversity, recreational, cultural or existence values;

(d) The relative importance of the wide range of goods and services of forests depends on local and national environmental, social, cultural and economic conditions, and must be taken into account. Even when these goods and services are not explicitly valued, valuation is taking place;

(e) Economic valuation of forest-based goods and services can contribute to stakeholder negotiations and decisions regarding forest use, rights and responsibilities. For example, in the case of a watershed, stakeholders may agree on financial transfers from "winners" to "losers", thereby creating incentives for all involved.

Box 1
**Internalizing the externalities**

There are values of forests that go beyond the direct interest and economic incentives of the users. This may be because: (a) the values are external and occur, e.g., as "downstream" effects or so-called "global externalities"; (b) there is a lack of exclusive ownership, e.g., "open access"; or (c) there are distortions in the prices of marketed forest products.

Loggers and farmers may have an incentive to clear the forest to get timber and land for personal use, but their actions include a cost to others for the loss of environmental values. If loggers and farmers could capture some of this external value or be charged for the downstream effects, they would have a larger incentive not to clear the forest. This exemplifies the "internalization of externalities", where the value of the externality becomes part of the resource users economic motivation.

Unless appropriate incentives are available to include the external values accruing both locally, nationally and internationally, local stakeholders may not be dependable allies for conservation or management for dispersed, intangible benefits. Incentives may be created by, for example, (a) compensating local loggers and farmers for the foregone economic return from voluntary restraints on forest harvesting; (b) imposing and enforcing charges on forest harvesting and land conversion; or (c) imposing and enforcing regulation (with or without compensation) to protect forests.

# III. Guidance from previous deliberations of the Intergovernmental Panel on Forests and the Intergovernmental Forum on Forests at its second session

10. Forest valuation was among the many issues discussed by IPF. Among its proposals for action, IPF:

(a) Encouraged countries, in collaboration with international organizations, to make use of available methodologies to improve estimates of the value of all forest goods and services. It was noted that economic valuation cannot be a substitute for political decisions, which includes balancing wide-ranging environmental, socio-economic, ethical, cultural and religious concerns;

(b) Requested international organizations and institutions to prepare comprehensive documents on available forest valuation methods and experience required for the valuation of forest goods and services, in particular those that are not traded in the marketplace;

(c) Invited countries and relevant international organizations and institutions to promote research to further develop forest valuation methodologies, in particular those related to deforestation and forest degradation, erosion, and criteria and indicators, taking into account the particular circumstances of each country.

11. At its second session, IFF noted that forest valuation is one of many tools for decision-making in sustainable forest management. In preparation for the substantive discussion at its third session, the Forum requested its secretariat to analyse and prepare specific proposals on the development of forest assessment and economic valuation methodology. It was suggested that this could include (a) analysis and proposals on the promotion and creation of market opportunities for non-timber forest products and services and practical examples, and (b) case studies of the value of non-wood goods and services.

12. There is an extensive literature addressing valuation methods and case studies. However, finding and using methods to assign economic values to non-marketed forests goods and services is often not perceived as an important constraint for sustainable forest management.

13. Forest value judgements are already frequently made without involving formal forest valuation tools, such as in the definition of harvesting regulations or the designation of protected areas. It is furthermore possible to recognize forest values without knowing their exact value.

14. The present report focuses on addressing the need for and application of valuation estimates, and how these are turned into incentives for sustainable forest management. The promotion and creation of market opportunities has been addressed in the report of the Secretary-General entitled "Issues that need further clarification: economic instruments, tax policies and land tenure" (E/CN.17/IFF/1999/13), and will only be briefly addressed in the present report.

# IV. Overview and issues concerning forest valuation

## A. Accounting and diversity of forest values

15. The sources of economic value for the different goods and services provided by forests are complex and difficult to add up. They include:

(a) The value of commodity production, e.g., timber and non-timber forest products. The economic return accruing to other sectors as a result of value added in production and processing of forest-based commodities, such as indirect employment and forward linkages, is included in the timber market price;

(b) The direct but external benefits to other sectors (off site) as a result of the services of forests, such as an increase in the productivity of other sectors through environmental protection, e.g., in watersheds;

(c) The non-market values of the forest sector (on site), such as recreational values;

(d) Potential but often unrealized market values, such as from developing markets for tourism, pharmaceuticals or non-timber forest products;

(e) The value to society derived from the existence and services of forests (frequently estimated as the willingness to pay, for example, for the protection of forest ecosystems and biodiversity), which potentially may be converted into economic transfers;

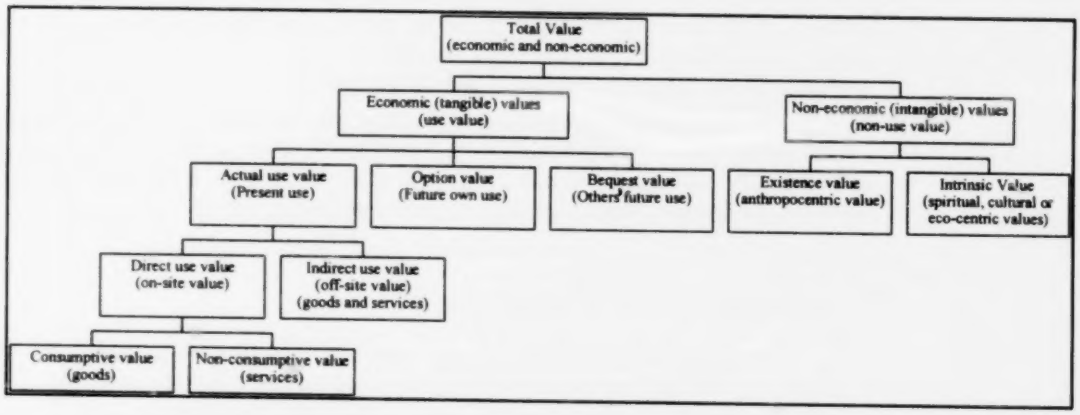
(f) Ecological, spiritual, cultural and indigenous values related to forests.

16. These values are not all perceived as originating from the forest sector, nor are they all typically captured within the forest sector. However, they are components of a total economic value attributable to the full range of goods and services. A systematic assessment of forest goods and services in physical terms, and when feasible in economic terms, can

identify and quantify these forest benefits. Systems of national accounts or other types of resource accounts can monitor and report such sectoral information. Due consideration must be given to whether additional values are created or a valuation of forest values is merely a reclassification of existing values across different sectors.

17. The diversity of forest values is well described in the literature. Forest values are existing, and can increase or decrease with or without knowledge of their economic value. Not all forest benefits can or need to be quantified in economic terms, although any action to protect or deplete non-market benefits includes an implicit valuation. An overview of the typology of values is shown in the accompanying figure, and a distinction is made between the economic (mostly tangible) and non-economic (intangible) forest benefits; economic forest benefits also include actual and potential use values. The non-economic forest benefits include, for example, existence values (the welfare associated with the preservation of forest resources, the general value of biodiversity) and other values (cultural, spiritual).

**Overview of forest values**




18. The different types of forest values and the methods that can be applied to assess these values are well described in the literature, and further development in this area is ongoing in many countries. Studies have commonly been conducted in a given locality, and have selected one or a few available forest benefits. Unfortunately, valuation studies of non-timber forest products seldom also include services and vice versa. If a total economic value has been attempted, this has been based on benefit estimates from other studies.

19. Limitations of valuation studies are often a consequence of limited availability of quantitative data rather than limits on the availability of valuation methods or experiences. If physical data on different forest goods and services are available, economic assessment is often straightforward.

## B. Approaches to assessing forest values

20. Valuing of forest goods and services is generally not constrained by the availability of valuation methods. These methods include (a) the valuation of physical flows, e.g., of timber, with direct or shadow price adjusted market prices and extraction costs; (b) survey based methods to elicit willingness-to-pay estimates; (c) indirectly derived market values from substitutes or implicit values, such as variation in property values; and (d) cost approaches based on opportunity costs. The choice of valuation methodology depends on the type of forest value, the demand and use for improved value estimates, and the level of detail or precision that is required.

21. Most highly precise valuation studies share a few common features: they are derived from research projects and they are typically expensive. Forest policy and management seldom require the full-scale valuation undertaken in research projects. Instead, methods for quick and inexpensive valuation estimation are required. A promising approach is "benefits transfer", in which valuation estimates from studies of similar forest goods and services are adapted for a particular decision problem. The strength of this approach is that existing information is made available at a low cost, and it is thus a powerful application of the knowledge base of forest valuation studies. But the limitation of this approach is that valuation estimates are applied to situations that may not accurately reflect the current context and which cannot be applied as an average value for every forest (see box 2).

22. The economic analysis of the value of forest goods and services should also include an assessment of the costs of providing them. For example, stands of timber are not valued according to the market value of timber, but the cost of extraction and transport is deducted as well as the foregone benefits of a harvest before economic maturity.

Box 2
**Developing estimates for benefits transfers**

The range of the potential net average economic value from one hectare (ha) of forest land has been estimated from published studies. This type of global benefits transfer provides a crude magnitude of the potential economic value. A 1998 study by Constanza, for example, estimated the average annual value of a tropical forest to be on the order of $2,007 per ha and $302 per ha for temperate forest, including production of timber. In a 1995 study, Lampietti and Dixon with a similar approach determined the average annual value to be about $250 per ha for both tropical and temperate forests but with a larger share of values from studies on non-timber forest products in tropical forests and recreational services in temperate forests.

The application of such estimates as averages for all forests may well exaggerate the value of many forests. No valuation study is known to provide a complete economic valuation without use of benefits transfer. In the studies incorporating benefits transfer, estimates of total economic value per hectare are based on the assumption that all values are additive. That is, it is assumed that recreational value measured at one site and the biodiversity value estimated at another can be added to yield an aggregate value of a forest in which both benefits are present. Another limitation is that specific characteristics of individual forests are not detected.

23. The opportunity cost of supplying non-market forest goods and services, for example, through the designation of protected forest areas, is an indication of the investments required to compensate foregone financial returns from commodity production. When the range of different values gained from the protection of a forest project is assessed, it is relevant to know what the opportunity costs are, for example, of establishing a park in comparison with an unregulated logging scenario. The opportunity cost approach, rather than the estimated value of goods and services approach, is a benchmark for economic transfers for a foregone revenue (see box 3).

24. Supply cost (the opportunity cost) of protection or sustainable management provides a benchmark for possible but not compulsory compensation and for determining the cost of efficient policies. Estimates of the value of forest goods and services are the derived demand, but as a measure for a hypothetical compensation they include additional economic returns (profits) beyond what is needed for investment in the forest sector.

## C. Case studies of the value of forest goods and services

25. Examples of the application of valuation methods are abundant but also represent a diversity of the different valuation contexts, methodology, quality, and type of goods and services valued. A general feature is that because of diversity the different case studies are seldom comparable and general lessons are difficult to draw for forest policy. For example, a study of tropical forests near two different Amerindian villages in southern Venezuela provide economic values of US$ 1,902 and US$ 4,696 per year per household. While this study tells us that the forests are important to the indigenous communities, such valuation numbers do not speak directly to a particular forestry policy decision because the valuation exercise is not tied to a particular policy choice.

Box 3
**The cost side of forest values**

There is both a benefit and a cost side to valuation. While the attention is often on the benefit side, there is also some merit to identifying the costs. The direct costs of protection or sustainable management of a forest area are the opportunity cost of the foregone economic benefits, for example from timber production, that is "invested" to increase or secure non-market benefits. A forest investment may be economically justifiable if the opportunity costs per ha compared to unregulated logging or deforestation were, for example, on the order of:

(a) Thousands of United States dollars per year in a unique forest area;

(b) Thousands of United States dollars per year for a managed forest with some environmental diversity and environmental protection services;

(c) Tens of United States dollars annually or less for less important forest areas.

One example is the Noel Kempff climate action project in Bolivia, where a transfer of US$ 9.5 million was made for the estimate of the carbon emission avoided by expanding the park. The money was spent almost equally (a) to compensate landholders for their forest harvesting rights, (b) to commercialize bio-prospecting, and to develop eco-tourism and environmental protective uses, (c) for an endowment fund, and (d) for protection of the park and technical assistance. Although the investment was for a single environmental service, it was sufficient to cover the opportunity costs of protecting the park and supplying other goods and services.

26. Examples of both benefit and cost-based valuation examples from the World Bank are contained in box 4.

## D. "Internalizing the externalities": capturing the values of forests

27. One cause of unsustainable management and the depletion of forests is the absence of incentives to capture all forest values, even if large values are at stake. Previous discussions of valuation highlighted the fact that benefits of a wide variety of services, including carbon sequestration, biodiversity conservation, recreation and watershed protection, do not usually accrue to the forest owner or manager. Although incredibly large values of, for example, carbon sequestration and other forest goods and services are reported, these do not reflect what owners of forest resources should anticipate as an "internalized" economic return. The question is: who would pay such values and what would they gain by doing so?

Box 4
**Some valuation examples from the World Bank**

In **Madagascar**, a survey study (contingent valuation) was used to estimate the value that local communities would be willing to accept in compensation (denominated in units of rice or staple food) to forego access to forests in a designated area of the Mantadia National Park. The responses were used to estimate a mean value per household of about US$ 108. In another study, the value international tourists would be willing to pay for access was estimated to be US$ 65 per tourist.

In **Croatia**, survey studies estimated the willingness of tourists to pay for restoration of destroyed forested landscapes in coastal areas. One study was carried out in Croatia and one among foreign tourists at a similar site in Italy. Both studies showed a willingness to pay for forested landscapes of about US$ 3 per visitor per day.

In **Haiti**, an economic analysis of the Pic Macay National Park (about 3,500 ha) used several valuation techniques in a data-scarce environment. The objective of the project was to protect critical remnants of Haiti's forests, preserve potential development of tourism protect downstream agricultural production and regulate water flows. The estimate of the change in productivity for downstream agriculture was US$ 2 to 7 million (the wide range reflecting the weakness of the underlying data). The replacement costs of irrigation and other infrastructure were used to estimate the value of avoided damage costs from protection of water flows. Relative to the no-project case, the value was estimated at US$ 2.5 to 5 million. The opportunity cost of the project from not converting the forest to agriculture was also addressed. The current value of foregone agricultural production was estimated at US$ 175,000, and the low value is due to poor conditions for agriculture. Lack of timber inventory prevented an estimate of the value of forest harvesting, but the value was presumably low due to high extraction and transport costs.

28. It is possible to value forest goods and services at risk of being depleted, but additional actions are required to actually convert the findings from a valuation study into economic incentives or regulation to adjust the behaviour of the involved stakeholders. There are several ways to "internalize" and possibly safeguard forest values:

(a) Creating and facilitating market opportunities for a wider range of forest products and services;

(b) Improving the efficiency of forest management and private-sector investment and capturing higher economic returns from forest management;

(c) Introducing transfers (subsidies) for sustainable forest management and/or disincentives (e.g., taxation) to avoid unwanted change in land use;

(d) Imposing constraints on land use and forest management through regulation, such as a code of practice;

(e) Entitling and enforcing property rights and regulating open-access exploitation;

(f) Maximizing the benefits (and minimizing the risks) of decentralization, with community-based planning and decision-making procedures through which the needs of local people are reflected in management decisions;

(g) Reducing government failures leading to rent-seeking (including corruption) and removing perverse subsidies and price regulations.

29. The distributional consequence of any policy actively seeking to balance the values of forest goods and services must be considered along with the assessment of values and identification of methods to internalize forest values. The ability to capture the value of non-wood goods and services from forests and distribute them effectively and equitably depends on physical, economic and political conditions.

30. The choice whether to use incentives based on subsidies, disincentives based on charges or other regulation measures is political, primarily because the distribution of costs and benefits must be a central consideration. There is no general technical recommendation possible on what type of instruments to apply on efficiency grounds, but decision makers must explore the distributional effects of different approaches. A policy measure to achieve sustainable forest management is not a one-stringed instrument but includes several options with different distributional implications.

## E. Financial values: valuation of timber and forest land

31. An important part of the total economic value of forests is the financial costs and benefits, i.e., those values that occur as real economic flows to and from the forest sector. They are easier to value, and therefore often left out in the presentation of valuation methodologies, but financial values are also part of the total.

32. There are causes of non-sustainable forest management other than lack of accurate information on valuation. Some lessons can be learned from why even a marketed good like timber is often not managed efficiently, e.g.:

(a) Failure to make a distinction between the short-term value of exploitation and the long-term depletion of a renewable asset (resulting from non-sustainable production levels or methods);

(b) Open-access or unclear user/property rights that reduce incentives to promote regeneration and efficient forest management. In these circumstances, future economic rents from investments are not secure;

(c) Underpricing of forest resources, resulting in rent-seeking and excess profit formation.

33. Underpricing and overexploitation of timber and forest land can lead to non-sustainable forestry practices. While the valuation of non-market goods and services should gain explicit attention, it is crucial to recognize that improved management and valuation of marketed forest resources also contribute to sustainable forest management.

## F. Other topics influencing valuation

34. If valuation is not accompanied by the commitment and ability to implement related regulation, the intended effect of valuation estimates (identifying potential externalities to be internalized), will not emerge. Valuation is not a policy instrument on its own. The importance of valuation is in the impact it has on policy making and to what extent relevant policy means and incentives are established to take forest goods and services into account.

35. Forest valuation can help to identify "losers" and "winners" among stakeholders. Not being able to capture the value of forest goods and services (or the economic consequences of their depletion) is a plausible cause of an unsustainable forest practice — one reason why regulation may be needed. How effective a valuation can be depends on the policy context and the underlying causes of poor forest management and utilization. Examples include:

(a) Market failure from an insufficient recognition of the range of forest benefits (non-market values and lack of market transactions);

(b) Lack of established or agreed property rights, preventing a proper capture of the resource values by the resource user or owner;

(c) Weak institutional capacity, resulting in an inability to implement and enforce a policy that could improve utilization and/or protection of forest resources;

(d) Governmental failures resulting in rent-seeking and institutional weakness or corruption which may undermine sustainable forest resource use and management.

36. Improved information on forest values must be considered an integral part of policy regulations, aimed at correcting price signals and also considering why forest values are not properly reflected in utilization and management of forests. For forest policy, valuation has a role in the selection and comparison of alternative policy options and in informing the selected mode of implementation. It also has a role in the monitoring and review of policy performance or lack of a policy. It may first of all be crucial to identify the impacts of alternative policy options compared with an alternative (the "with" and "without" principle). A second step may be an economic assessment of the impacts either through a complete valuation study, a benefits transfer, or soliciting experts' advice for determining imputed values.

37. Information on the total economic value of forests is one possible way to identify and design policies to address the loss and degradation of forests. The question is to what extent a monetary quantification of forest values can be a substitute for the informed judgement of the decision makers regarding the balancing of multiple objectives and values in forest management and policy. On its own, valuation will not ensure that non-market goods and

services are better utilized or protected. Nor does an absence of explicit and monetary valuation signal that non-market forest goods and services are of no importance.

# V. Preliminary conclusions and proposals for action

38. Even assuming that the value of sustainable forest management to the local, national and international community could be perfectly quantified in monetary terms, and that financial resources consistent with the opportunity costs of supplying these values were made available, at least three additional requirements exist for sustainable forest management:

(a) Stable and effective institutions for forest policy supervision and forest management;

(b) Allocation of financial resources to compensate those who practice a non-preferred forest use, or disincentives created through enforced regulations;

(c) Eliminated policy distortions, e.g., designated forest resource user rights to enhance incentives for protection of longer-term benefits.

39. The scope and type of participation, the institutions for decision-making and resource allocation, and the distribution of wealth and income are powerful determinants of the values expressed by individuals, groups and nations. Open, participatory, representative processes typically yield the best information on the range of benefits, variations in preferences, the ideal balance among the mix of alternative values, and the most enduring decisions with respect to allocation among choices for the outputs of forests. Choices also change, over time, as do preferences, the physical environment, and participants in the decision process.

40. A detailed valuation of non-market goods and services will not be common for forest policy-making or forest management due to its costs and because such level of detail is not always needed. The application of rapid economic appraisals is and will continue to be widespread. Academic studies on the topic will continue to provide fuel for thought for development of innovative forest policy and management.

41. The lack of internalization of externalities, failures in the policy environment or the absence of effective and equitable distribution of costs and benefits are among the reasons forests are overexploited and underprotected, not the lack of valuation per se.

42. Forest valuation is not a substitute for political decisions, which include balancing wide-ranging environmental, socio-economic, ethical, cultural and similar concerns. Without a recognition of the policy failures causing the depletion of forest resources, valuation will raise unrealistic expectations.

## A. Accounting for forest values

43. Accounting for the variety and quantity of goods and services provided by forests, and a reliable indication of their relative value to society, is a fundamental requirement for addressing the full costs of forest degradation and deforestation and the benefits of sustainable forest management. Valuation without a quantification of the underlying physical variables, such as changes in removals or timber, number of visitors, species number and diversity, and loss of soil to erosion, may yield an economic figure but is based on uncertain assumptions.

44. The Forum may wish to:

(a) Urge Governments to improve collection of quantitative data to enumerate and develop physical accounts for the range of forest outputs and services, including inventories of timber and other goods and services, and impacts of changes in forest use on the environment. It is a lack of this type of information that commonly is the major constraint to both informed policy-making and forest valuation;

(b) Encourage Governments to identify local and national needs and applications and sources for quantitative data on forests.

## B. Valuation methods

45. There is an extensive literature on valuation methods and examples of valuation studies. The methodological basis is not considered to be a constraint for forest valuation, although further methodological development may be encouraged. A major problem is the cost of a complete valuation study of sufficient quality, and low-cost short-cuts, such as benefits transfers, i.e., use of values from other existing studies, can be worth pursuing not uncritically. Another aspect is the assessment of costs of supplying forest values, which is a foregone financial benefit from changes in forest management.

46. The Forum may wish to recognize the important progress in the development of valuation methods, and recognize that this is an active research area in many countries without need for additional actions from IFF; however, the Forum may also wish to advise countries and international organizations to focus on the development of approaches for low-cost valuation methods.

## C. Internalizing the externalities: capturing the values of forests

47. The connection between valuation and forest policy tools and other regulation is in the possibility to internalize the consequences of actions through economic incentives or legal requirements. Internalization may be but is not limited to an economic transfer. If economic transfers are developed, these should equal the costs of internalizing the externality, and should be invested in sustainable forest management. Valuation estimates can reveal what the forest may be worth nationally and internationally, but this may not be what it is potentially worth to the forest owner. If valuation is used as a benchmark for an economic transfer, the forest owner is overcompensated beyond the accruing costs.

48. The Forum may wish to:

(a) Urge Governments to recognize the national cost and benefits of forests, in particular where forests are state property, to ensure that externalities are internalized through forest regulation and management;

(b) Develop an approach for the identification of the costs of sustainable forest management (a supply price), which can be used for a cost-efficient use of scarce investment funds for forest values.

## D. Role of markets for non-timber goods and services

49. Turning non-market goods and services into market values through the development and promotion of marketing has some prospects. However, as is currently the case, expanding markets for forest goods and services must be balanced with production, consumption and trade in other goods and services from forests. Valuation may provide some estimates of demand. One other issue is the assessment of the production costs and identification of both institutional and ecological obstacles that limit the option for sustainable trade, such as property rights, spatial distribution and density, dependency of secondary forests for economic production, and identification of a sustainable level of production.

50. The Forum may wish to:

(a) Exploit the possibility to develop international trade channels for minor forest products based on a certified level of sustainable production, and promote new products and market potentials, while ensuring that international trade organizations recognize any special requirements for such trade;

(b) Coordinate the possible development of trade in carbon emission rights with the United Nations Framework Convention on Climate Change, ensuring that the potential enumeration of carbon credits does not compromise the outputs of other forest goods and services, in particular local needs, and ensuring that any return from a possible trade in carbon credits is used exclusively for forest investments or for the benefit of local people.

## E. Valuation and the "policy environment"

51. The creation of new institutions and mechanisms or the development of new analytical techniques in order to assure the continued production of non-market goods and services from forests will not be required in most cases. A practical step would be to regulate the causes in the "policy environment" resulting in an insufficient supply of non-market goods and services, such as policy failures or lack of tenure.

52. The Forum may wish to encourage countries to consider integrating economic instruments, tax policies and land tenure and other improvements in the policy environment that may lead to an indirect internalization of externalities by more efficient management of forest resources, removal of policy failures, and providing legitimate tenure to land and forest resources.